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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OGILVY RENAULT LLP 1981 MCGILL COLLEGE AVENUE SUITE 1600 MONTREAL, QC H3A2Y3 CANADA			PHAN, HANH	
			ART UNIT	PAPER NUMBER
			2638	
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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/722,339	<b>Applicant(s)</b> SMITH ET AL.	
	<b>Examiner</b> Hanh Phan	<b>Art Unit</b> 2638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 25-49 is/are rejected.
- 7) ☒ Claim(s) 20-24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 11/10/2005.
2. The indicated allowability of claims 3-7, 15-19, 27-31 and 39-43 is withdrawn in view of the newly discovered reference(s) to Rasanen (US Patent No. 6,721,304), Eng et al (US Patent No. 5,175,640) and Fatehi et al (US Patent No. 6,185,021). Rejections based on the newly cited reference(s) follow.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-12, 25-36 and 44-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

-In claim 1, the phrase "**whereby performance variations between the N channels are equalized by averaging within each of the M data signals**" is unclear.

-In claim 25, the phrase "**whereby performance variations between the N channels are optically equalized by averaging within each of the M data signals**" is unclear.

-In claim 44, the phrase "**the apparatus comprising means for processing respective composite data streams received over the N channels to recover the M**

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**parallel data signals**” is unclear because how to generate the composite data streams over the N channels for processing to recover the M parallel data signals.

-In claim 44, the phrase “**An apparatus for enabling optical equalization across N channels of a multi-channel link of a communication network, in which a substantially equal portion of each one of M parallel data signals is conveyed through each one of the N channels**” is unclear. What element generates a substantially equal portion of each one of M parallel data signals is conveyed through each one of the N channels.

5. Claims 37-43 are rejected under 35 U.S.C 112 first paragraph because claim 37 is a single means claim (MPEP 2164.08(a)).

-In claim 37, means in phrase “ **the apparatus comprising means for distributing each of M parallel data signals across the N channels of the link, such that a substantially equal portion of each data signal is conveyed through each one of the N channels**” is a single means.

A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983)

A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.

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6. Claims 44-49 are rejected under 35 U.S.C 112 first paragraph because claim 44 is a single means claim (MPEP 2164.08(a)).

-In claim 44, means in phrase " **the apparatus comprising means for processing respective composite data streams received over the N channels to recover the M parallel data signals**" is a single means.

A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983)

A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 2, 13 and 14 are rejected under 35 U.S.C. 102 (e) as being anticipated by Rasanen (US Patent No. 6,721,304).

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Regarding claim 1, referring to Figures 5 and 6, Rasanen teaches a method of equalization across  $N$  channels, where  $N$  is an integer greater than 1, of a multi-channel link of a communications network, comprising steps of:

distributing each one of  $M$  data signals, where  $M$  is an integer greater than 1, across the  $N$  channels of the link, such that a substantially equal proportion of each data signal is conveyed through each one of the  $N$  channels as a composite data stream (Figs. 5 and 6, col. 8, lines 10-67 and col. 9, lines 1-9); and

processing the composite data-streams conveyed through the  $N$  channels to recover the  $M$  data signals (Figs. 5 and 6, col. 8, lines 10-67 and col. 9, lines 1-9);

whereby performance variations between the  $N$  channels are equalized by averaging within each of the  $M$  data signals (col. 2, lines 18-34).

Regarding claims 2 and 14, Rasanen further teaches wherein each data signal is Forward Error Correction (FEC) encoded data stream (see Fig.1).

Regarding claim 13, referring to Figures 5 and 6, Rasanen teaches a method of equalization across  $N$  channels, where  $N$  is an integer greater than 1, of a multi-channel link of a communications network, comprising steps of:

distributing each one of  $M$  data signals, where  $M$  is an integer greater than 1, across the  $N$  channels of the link, such that a substantially equal proportion of each data signal is conveyed through each one of the  $N$  channels as a composite data stream (Figs. 5 and 6, col. 8, lines 10-67 and col. 9, lines 1-9); and

processing the composite data-streams conveyed through the  $N$  channels to recover the  $M$  data signals (Figs. 5 and 6, col. 8, lines 10-67 and col. 9, lines 1-9).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3-7 and 15-19 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Rasanen (US Patent No. 6,721,304) in view of Eng et al (US Patent No. 5,175,640).

Regarding claims 3 and 15, Rasanen further teaches dividing each one of the M data signals into N respective sub-streams of substantially equal length (Figures 5 and 6).

Rasanen differs from claims 3 and 15 in that he fails to specifically teach interleaving the sub-streams into respective ones of the N channels. However, Eng in US Patent No. 5,175,640 teaches interleaving the sub-streams into respective ones of the N channels (Fig. 1, col. 1, lines 10-36). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the interleaving the sub-streams into respective ones of the N channels as taught by Eng in the system of Rasanen. One of ordinary skill in the art would have been motivated to do this since Eng suggests in column 1, lines 10-36 that using such the interleaving the sub-streams into respective ones of the N channels have advantage of allowing reducing memory usage and simplifying the design by reducing surrounding logic.

Regarding claims 4 and 16, the combination of Rasanen and Eng teaches wherein the step of dividing each data signal comprises a step of inserting a respective predetermined unique identifier into each sub-stream (see Figs. 5 and 6 of Rasanen and Fig. 1 of Eng).

Regarding claims 5 and 17, the combination of Rasanen and Eng teaches wherein the step of dividing each data signal comprises, steps of:

partitioning the data signal into a sequential series of data units having a predetermined length; and

forwarding each successive data unit, in turn, to a respective sub-stream (see Figs. 5 and 6 of Rasanen and Fig. 1 of Eng).

Regarding claims 6 and 18, the combination of Rasanen and Eng teaches wherein each data unit has a length of one or more bits (see Figs. 5 and 6 of Rasanen and Fig. 1 of Eng).

Regarding claims 7 and 19, the combination of Rasanen and Eng teaches the step of interleaving one sub-stream of each data signal into a respective one of the N channels comprises using a sequential interleaving process to select a data unit from one sub-stream of each data signal in a predetermined order, and forward each selected data unit, in turn, to the channel (see Figs. 5 and 6 of Rasanen and Fig. 1 of Eng).



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11. Claims 3-7 and 15-19 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Rasanen (US Patent No. 6,721,304) in view of Fatehi et al (US Patent No. 6,185,021).

Regarding claims 3 and 15, Rasanen further teaches dividing each one of the M data signals into N respective sub-streams of substantially equal length (Figures 5 and 6).

Rasanen differs from claims 3 and 15 in that he fails to specifically teach interleaving the sub-streams into respective ones of the N channels. However, Fatehi in US Patent No. 6,185,021 teaches interleaving the sub-streams into respective ones of the N channels (Fig. 5, col. 4, lines 44-67). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the interleaving the sub-streams into respective ones of the N channels as taught by Fatehi in the system of Rasanen. One of ordinary skill in the art would have been motivated to do this since Fatehi suggests in column 4, lines 44-67 that using such the interleaving the sub-streams into respective ones of the N channels have advantage of allowing reducing memory usage and simplifying the design by reducing surrounding logic.

Regarding claims 4 and 16, the combination of Rasanen and Fatehi teaches wherein the step of dividing each data signal comprises a step of inserting a respective predetermined unique identifier into each sub-stream (see Figs. 5 and 6 of Rasanen and Fig. 5 of Fatehi).

Regarding claims 5 and 17, the combination of Rasanen and Fatehi teaches wherein the step of dividing each data signal comprises, steps of:

partitioning the data signal into a sequential series of data units having a predetermined length; and

forwarding each successive data unit, in turn, to a respective sub-stream (see Figs. 5 and 6 of Rasanen and Fig. 5 of Fatehi).

Regarding claims 6 and 18, the combination of Rasanen and Fatehi teaches wherein each data unit has a length of one or more bits (see Figs. 5 and 6 of Rasanen and Fig. 5 of Fatehi).

Regarding claims 7 and 19, the combination of Rasanen and Fatehi teaches the step of interleaving one sub-stream of each data signal into a respective one of the N channels comprises using a sequential interleaving process to select a data unit from one sub-stream of each data signal in a predetermined order, and forward each selected data unit, in turn, to the channel (see Figs. 5 and 6 of Rasanen and Fig. 5 of Fatehi).

12. Claims 25-31 and 37-44 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Rasanen (US Patent No. 6,721,304) in view of Fatehi et al (US Patent No. 6,185,021).

Regarding claims 25, 27, 37, 39 and 44, Rasanen teaches all the aspects of the claimed invention and further teaches dividing each one of the M data signals into N respective sub-streams of substantially equal length (Figures 5 and 6).

Rasanen differs from claims 25, 27, 37, 39 and 44 in that he fails to specifically teach interleaving the sub-streams into respective ones of the N optical channels.

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However, Fatehi in US Patent No. 6,185,021 teaches interleaving the sub-streams into respective ones of the N optical channels (Fig. 5, col. 4, lines 44-67). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the interleaving the sub-streams into respective ones of the N optical channels as taught by Fatehi in the system of Rasanen. One of ordinary skill in the art would have been motivated to do this since Fatehi suggests in column 4, lines 44-67 that using such the interleaving the sub-streams into respective ones of the N channels have advantage of allowing reducing memory usage and simplifying the design by reducing surrounding logic.

Regarding claims 26 and 38, Rasanen further teaches wherein each data signal is Forward Error Correction (FEC) encoded data stream (see Fig.1).

Regarding claims 28 and 40, the combination of Rasanen and Fatehi teaches wherein the step of dividing each data signal comprises a step of inserting a respective predetermined unique identifier into each sub-stream (see Figs. 5 and 6 of Rasanen and Fig. 5 of Fatehi).

Regarding claims 29 and 41, the combination of Rasanen and Fatehi teaches wherein the step of dividing each data signal comprises, steps of:

partitioning the data signal into a sequential series of data units having a predetermined length; and

forwarding each successive data unit, in turn, to a respective sub-stream (see Figs. 5 and 6 of Rasanen and Fig. 5 of Fatehi).

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Regarding claims 30 and 42, the combination of Rasanen and Fatehi teaches wherein each data unit has a length of one or more bits (see Figs. 5 and 6 of Rasanen and Fig. 5 of Fatehi).

Regarding claims 31 and 43, the combination of Rasanen and Fatehi teaches the step of interleaving one sub-stream of each data signal into a respective one of the N channels comprises using a sequential interleaving process to select a data unit from one sub-stream of each data signal in a predetermined order, and forward each selected data unit, in turn, to the channel (see Figs. 5 and 6 of Rasanen and Fig. 5 of Fatehi).

#### ***Allowable Subject Matter***

13. Claims 8-12, 20-24, 32-36, 39-43 and 45-49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and overcome the 112 rejection.

#### ***Response to Arguments***


14. Applicant's arguments with respect to claims 1-49 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Phan whose telephone number is (571)272-3035.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

  
**HANH PHAN**  
**PRIMARY EXAMINER**